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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,571	11/18/2003	Atsuo Omaru	113184-094	4752
29175	7590	03/15/2005	EXAMINER	
BELL, BOYD & LLOYD, LLC P. O. BOX 1135 CHICAGO, IL 60690-1135			DOVE, TRACY MAE	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 03/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/715,571

Applicant(s)

OMARU ET AL.

Examiner

Tracy Dove

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/043,634.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to the communication filed on 12/27/04. Applicant's arguments have been considered, but are not persuasive. Claims 15-20 are pending and remain rejected in view of the prior art of record. This Action is made **FINAL**.

Claims Analysis

Claims 16-20 contain limitations regarding the components of the conductive agent of claim 15. The limitations of claims 16-20 apply to both the conductive agent of the anode mix and the conductive agent of the cathode mix.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idota et al., US 5,686,203.

Idota teaches a non-aqueous secondary battery comprising a positive electrode active material, a negative electrode active material and a non-aqueous electrolyte (see abstract). The electrolyte comprises a solvent and a lithium salt soluble in the solvent (col. 14, lines 17-19). The positive and negative electrodes of the non-aqueous battery are produced by applying an electrode mixture for positive or negative electrode onto a current collector. The electrode mixture for positive and negative electrode may comprise, in addition to the positive or negative electrode active material, a conductivity-imparting agent and other various additives (col. 2, lines

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66-col. 3, lines 7). The positive electrode may comprise lithium cobalt oxide, lithium nickel oxide or lithium manganese oxide (col. 8, lines 35-62). The negative electrode may comprise any compound capable of absorbing and releasing light metal ions such as carbonaceous compounds and inorganic oxides. Preferable are carbonaceous compounds capable of being doped with and releasing lithium ions. The carbonaceous compound may be graphite (col. 9, lines 45-col. 10, lines 24). See also col. 11, lines 12-17. The conductivity-imparting agent may be any electron conductive material which does not undergo any chemical change in the assembled battery. The electrode mixtures may comprise at least one conductive material selected from the group consisting of naturally occurring graphite (such as scaly graphite, flaky graphite and clayey graphite), artificial graphite, carbon black, acetylene black, ketchen black, carbon fibers, powdery metals, metal fibers, polyphenylene derivatives and mixtures thereof. In particular the use of graphite is preferred because the resulting battery exhibits improved charge-discharge cycle life and the use of acetylene black is preferred because the resulting battery has high charge and discharge capacities. Moreover, the use of the combination of graphite and acetylene black is particularly preferred (col. 13, lines 15-35). It is also preferred to use a combination of graphite and carbon black wherein the ratio of graphite to carbon black preferably ranges from 10/1 to 1/10, in particular 5/1 to 1/5 (col. 13, lines 43-46). The amount of the conductivity-imparting agent incorporated into the electrode mixtures is preferably 1-10% by weight (col. 13, lines 36-42). Idota teaches the Lc of select conductivity imparting agents with artificial graphite having an Lc of 266.8 Å (26.68 nm) and acetylene black having an Lc of 59.6 Å (5.96 nm) (granular carbon having an Lc of 100 nm or less).

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Idota has specific combination of conductivity-imparting agents such as graphite and acetylene black (col. 13, lines 34-35), graphite and carbon black (col. 13, lines 44-47), flaky graphite and acetylene black (col. 20, lines 45-47) and artificial graphite and acetylene black (col. 23, lines 50-52).

Idota does not have a specific teaching of a conductivity-imparting agent combination of flaky graphite, carbon black and a granular carbon having an Lc of 100 nm or less.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because Idota teaches the conductivity-imparting agent may contain various carbon materials such as flaky graphite, carbon black, acetylene black, artificial graphite and mixtures thereof (col. 13, lines 23-27). The courts have ruled, it is prima facie obvious to combine two compositions, each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose, *In re Kerkhoven*, 205 USPQ 1069, 1072. Thus it would be obvious to combine the artificial graphite (first composition) with the flaky graphite and acetylene black (second composition) to form a conductivity-imparting agent including artificial graphite, flaky graphite and acetylene black (third composition). [note acetylene black is a carbon black] Furthermore, one of skill would be motivated to use a conductivity-imparting agent of including graphite and acetylene black because graphite improves the charge-discharge life of the battery and acetylene black improves the charge and discharge capacities of the battery (col. 13, lines 29-33).

As to the bulk density of the carbon materials of the conductive agent, the bulk density is a measure of the packing density. In battery electrodes it is desirable to pack as much electrode material as possible into the allotted electrode space to obtain a higher capacity and energy

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density. Hence, the skilled artisan would find it obvious to optimize the bulk density of the carbon material in order to be able to maximize the amount of electrode material and to achieve higher capacity and energy density. Specifically, the less space taken up by the conductive agent (not an active material), the more space available for the active material that is required for the electrochemical reaction of the battery.

Response to Arguments

Applicant's arguments filed 12/27/04 have been fully considered but they are not persuasive.

Applicant asserts they "have surprisingly discovered that the specific material properties of the nonaqueous battery as required by the claimed invention can facilitate the performance of that battery. For example, by allowing the anode and the cathode to include flaky graphite and granulated carbon, long charge/discharge cycle lifetime can be obtained. In addition, by containing carbon black as conductive agent, longer charge/discharge cycle life can be obtained". However, Idota teaches the "discovery" asserted by Applicant. Specifically, Idota teaches the use of graphite is preferred because the resulting battery exhibits improved charge-discharge cycle life and the use of acetylene black (carbon black) is preferred because the resulting battery has high charge and discharge capacities. Moreover, the combination of graphite and acetylene black is particularly preferred (13:29-35).

Applicant argues Idota does not teach or suggest a conductive agent consisting essentially of flaky graphite, granular carbon and carbon black. Examiner disagrees and believes Idota suggests the claimed invention. Idota teaches the Lc of select conductivity imparting agents with artificial graphite having an Lc of 266.8 Å (26.68 nm) and acetylene black having an Lc of 59.6

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Å (5.96 nm) (granular carbon having an Lc of 100 nm or less). Conductive material may include naturally occurring graphite (such as scaly graphite, flaky graphite and clayey graphite), artificial graphite, *carbon black*, acetylene black, *ketchen black* or carbon fibers. The courts have ruled, it is prima facie obvious to combine two compositions, each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose, *In re Kerkhoven*, 205 USPQ 1069, 1072.

Applicant argues Idota does not disclose the specific combination of flaky graphite, carbon black and granular carbon as claimed. Examiner agrees with Applicant, thus, an anticipation rejection was not presented.

Applicant asserts the examples in Idota merely relate to a single type of carbonaceous material and thus does not motivate one skilled in the art to combine carbonaceous materials for greater effect. Examiner disagrees with Applicant's analysis of the Idota reference. Idota is not limited to any specific example disclosed and Idota clearly provides not only motivation to combine, but actually teaches combining carbonaceous materials for the conductive agent. Idota teaches the use of the combination of graphite and acetylene black is particularly preferred (col. 13, lines 15-35). It is also preferred to use a combination of graphite and carbon black wherein the ratio of graphite to carbon black preferably ranges from 10/1 to 1/10, in particular 5/1 to 1/5 (col. 13, lines 43-46).

Applicant refers to Table 6 of the specification in what appears to be an attempt to show evidence of unexpected results. However, evidence of unexpected results must distinguish the claimed invention over the *prior art of record*. Furthermore, Table 6 is not commensurate in

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scope with the claimed invention. Furthermore, the cathode conductive agent composition does not comprise carbon black.

Therefore, Applicant's arguments are not persuasive.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Tracy Dove', with a stylized, flowing script.

Tracy Dove
Patent Examiner
Technology Center 1700
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March 8, 2005